

# Work Order ID 87080

**\*87080\***

Page 1

July-10-12 3:01:44 PM

Item ID: D3688-1

Accept

**\*N900040100\***

Setup Start

**\*NS1\***

Revision ID:

Stop

**\*NS2\***

Item Name: STUD

Start Date: 7/10/12

Start Qty: 8.00

**\*8\***

Cust Item ID:

Required Date: 8/24/12

Req'd Qty: 8.00

**\*8\***

Customer:

Reference:

Run Start

**\*NR1\***

Approvals:

Process Plan:

Date:

Tooling:

Date:

Stop

**\*NR2\***

QC:

Date:

SPC (Y/N):

Date:

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D3688	Rev C								

100

0.00

**\*100\***

BAND SAW

Bandsaw

Memo

0.00

Jeaspa Bandsaw

\*\*\*DO NOT USE CHOP SAW\*\*\*

Cut blank 11.673" long

2L 12-08-09

8

110

0.00

**\*110\***

DOOSAN LATHE

Doosan

Memo

0.00

Doosan Lathe

1-Turn as per Folio FA718 Rev: AK & Dwg D3688 Rev: C 2-Deburr  
per dwg D3688

3-Check .625" bore with DT9530 GO/NO GO Gauge

2L 12-08-11

3

5

120

0.00

**\*120\***

QC2- Inspect parts off machine FAI/FAIB

QC

Memo

0.00

Quality Control

2L 12-08-11

3

5

W/O: 87080		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D 3688-1 PAR #: \_\_\_\_\_ Fault Category: Machining NCR: Yes ☒ No ☐ DQA: [Signature] Date: 12/10/27  
 Resolution: \_\_\_\_\_ Disposition: Scrap QA: N/C Closed: [Signature] Date: 12/10/29

NCR: 12-1960		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
		Thread pitch diameter under tolerance on 5 parts over max = .7737 min = .7687 (measurement wires)	<u>12-10-27</u>	CRITICAL PART, <del>LAST</del> CAN'T DEVIATE. SCRAP. <u>Q 12.9.14</u>			<u>12-10-27</u>	(DAS 16) 12/8/15
<u>12-7-12</u>		1-.765" RC. Operator error 2-.766" misread comment 3-.767" in program. 4-.767" 5-.767"	<u>[Signature]</u>	<u>\$114.84</u> <u>x 5</u> <u>\$574.20</u>	<u>12-7-12</u>	<u>12/8/15</u> DAS 13 2-89		

NOTE: Date & initial all entries

# Work Order ID 87080

July-10-12 3:01:44 PM

\*87080\*

Page 2

Item ID: D3688-1 Accept \*N900040100\* Setup Start \*NS1\*  
 Revision ID: Stop \*NS2\*  
 Item Name: STUD  
 Start Date: 7/10/12 Start Qty: 8.00 \*8\* Cust Item ID:  
 Required Date: 8/24/12 Req'd Qty: 8.00 \*8\* Customer:  
 Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_ Run Start \*NR1\*  
 QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_ Stop \*NR2\*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
170 *170* QC Quality Control	QC8- Inspect parts - second check  Memo 100% CHECK,CHECK ALL DIMENSIONS AND THREAD FIT	0.00  0.00				3	5		
180 *180* Purchasing Purchasing	PURCHASING  Memo Issue P/O: 17693 2Certificate of conformaty is required	0.00  0.00							CX 12/10/15 (8)
190 *190* Packaging Packaging	Receive & Inspect for Damage & Mat'l Certs  Memo Ensure certificate of conformity is attached	0.00  0.00				8x			Sp 12-8-20

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

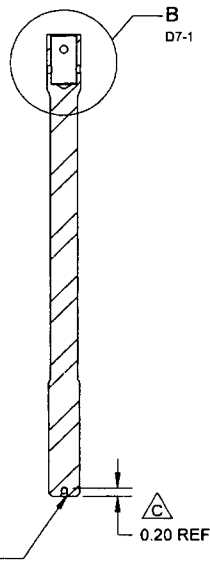
Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

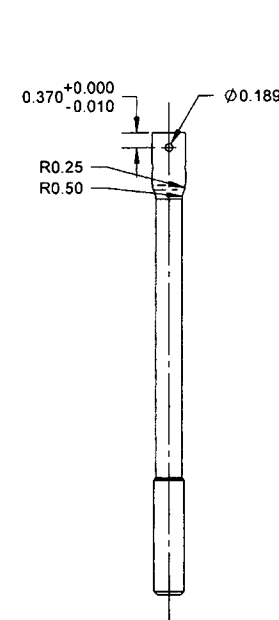
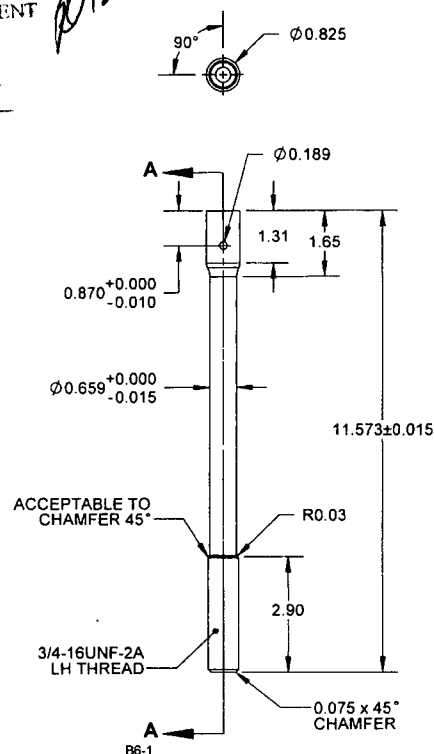
NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

P12-014<sup>4</sup>  
90°



**SECTION A-A**  
D4-1



RELEASED  
2009-09-22

**NOTES:**

- 1) MATERIAL: 17-4PH STAINLESS STEEL ROUND BAR PER AMS 5643 H-900 CONDITION  
2) FINISH: NONE  
3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED  
4) UNITS: INCHES UNLESS OTHERWISE NOTED  
5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX  
6) IDENTIFICATION: NONE  
7) WEIGHT: 1.24 lb  
8) LPI PER QSI 038 4.1.1 (ASTM E1417 LEVEL 2)

C	0.20 WAS 0.16 (ZN B5-1, B5-2, B6-3, B5-4); CENTER DRILL WAS CENTER DRILL #2 (ZN B5-1, B5-2, B6-3, B5-4) UPDATE NOTE 8 TO REF QSI (ZN A8-1, A8-2, A8-3, A8-4)	RF	09.09.09
B	CHANGE TO 17-4PH H-900 (ZN A8-1, A8-2, A8-3, A4-4); REDUCE LENGTH ON D3688-1 FROM 12.073 TO 11.573 (ZN C3-1) BASED ON PROTOTYPE INS'LL; 0.0.695 WAS 0.0.685 (ZN D8-1, D8-2, D8-3); 0.0.508 WAS 0.0.478 (ZN D8-4); REFORMATTED TO CURRENT DWG STANDARDS	RF	08.11.24
A	NEW ISSUE	RF	08.05.22
REV.	DESCRIPTION	BY	DATE
DESIGN	RF	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	<i>97</i>	DRAWING NO.	REV.
MFG. APPR.	<i>21</i>	D3688	SHEET 1 OF 1
APPROVED	<i>14</i>	TITLE	SCALE
DE APPR.	<i>4</i>	STUD	NT
DATE	09.09.09	COPYRIGHT © 2008 BY DART AEROSPACE LTD THIS DOCUMENT OR PARTS AND/OR CONTENTIAL HAS IS SUPPLIED ON THE EXPRESS UNDERSTANDING THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT	

8

7

6

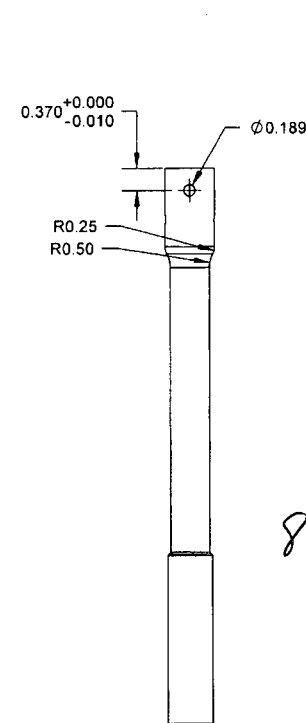
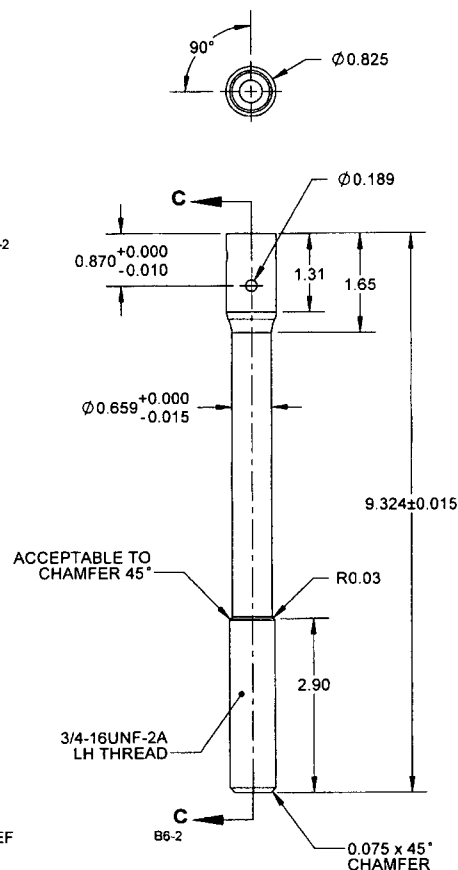
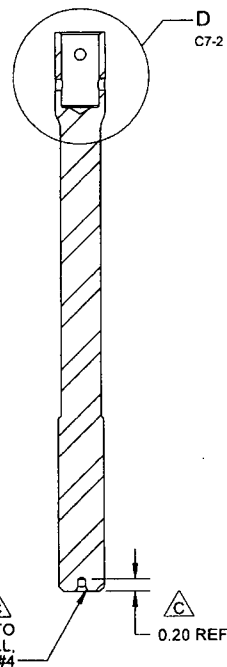
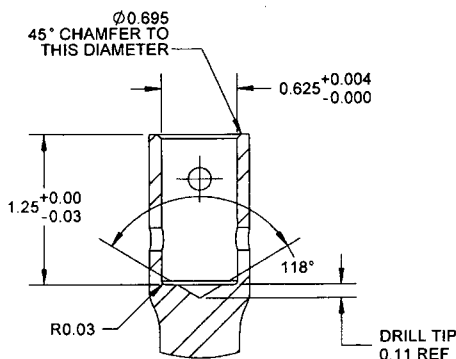
5

4

3

2

1



87880

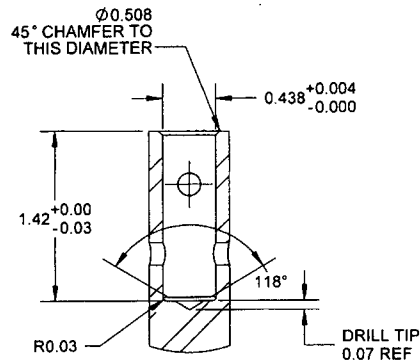
RELEASED  
2009-09-22

## NOTES:

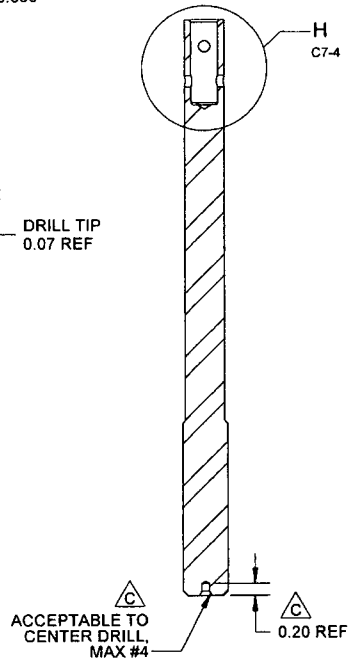
- 1) MATERIAL: 17-4PH STAINLESS STEEL ROUND BAR PER AMS 5643 H-900 CONDITION
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: 0.97 lb
- 8) LPI PER QSI 038 4.1.1 (ASTM E1417 LEVEL 2)

DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED	GP	DRAWING NO.	REV. C
MFG. APPR.	GP	D3688	SHEET 2 OF 4
APPROVED	GP	TITLE	SCALE
DE APPR.	GP	STUD	NTS
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**DETAIL H**  
SCALE 2X  
D6-4

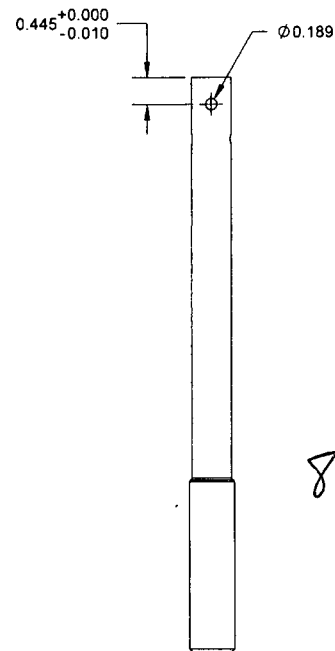


**SECTION G-G**  
D4-4

**D3688-7 STUD**

**NOTES:**

- 1) MATERIAL: 17-4PH STAINLESS STEEL ROUND BAR PER AMS 5643 H-900 CONDITION
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: 0.97 lb
- 8) LPI PER QSI 038 4.1.1 (ASTM E1417 LEVEL 2)



87080

**RELEASED**  
2009-09-22

DESIGN	RF	<b>DART AEROSPACE LTD</b>	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	GP	DRAWING NO.	REV. C
MFG. APPR.	GP	D3688	SHEET 4 OF 4
APPROVED	GP	TITLE	SCALE
DE APPR.	GP	STUD	NTS
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<b>DART AEROSPACE LTD</b>		<b>Work Order:</b> 87080
<b>Description:</b> Stud		<b>Part Number:</b> D3688-1
<b>Inspection Dwg:</b> D3688	<b>Rev:</b> C	<b>Page 1 of 1</b>

### FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
Ø0.695	+/-0.010	.685	/		2.02	
0.625	+0.004/-0.000	.628	/			
1.25	+0.000/-0.03	1.226	/			
118°	0.5°	118°	/			
R0.03	+/-0.030	.02	/			
0.11 Ref	+/-0.030	.11	/			
90°	0.5°	70°	/			
Ø0.189	+0.005/-0.001	.190	/			
1.31	+/-0.030	1.310	/			
1.65	+/-0.030	1.650	/			
0.870	+0.000/-0.010	.868	/			
Ø0.659	+0.000/-0.015	.656	/			
11.573	+/-0.015	11.575	/			
2.90	+/-0.030	2.90	/			
3/4-16UNF-2A	N/A	2A	/			
0.075 x 45°	+/-0.010 x 0.5°	.085	/			
0.370	+0.000/-0.010	.368	/			
Ø0.189	+0.005/-0.001	.190	/			
R0.25	+/-0.030	R.25	/			
R0.50	+/-0.030	R.50	/			

<b>Measured by:</b> RF	<b>Audited by:</b> (DA) 13	<b>Prototype Approval:</b>	N/A
<b>Date:</b> 12-8-11	<b>Date:</b> 12/8/14	<b>Date:</b>	N/A

Rev	Date	Change	Revised by	Approved
A	09.05.11	New Issue	KJ	
B	09.11.04	Dwg Rev updated	KJ	





## LIQUID PENETRANT TEST REPORT

P- 12727

CLIENT	<u>DATA SPACE</u>	DATE	<u>August 15/12</u>	PAGE	<u>1</u>	OF	<u>1</u>
ATTENTION	<u>MAT/LINDA</u>	ACUREN JOB NO.	<u>188-12-C0316</u>	TIME	AM <input checked="" type="checkbox"/>	PM <input type="checkbox"/>	
ADDRESS	<u>1270 ABERDEEN</u>	PO/VO No.	<u>-</u>				
	<u>HAWKESBURY, ON.</u>	WORK LOCATION	<u>SAME</u>				
PROJECT	<u>CROSS TUBES</u>	ACCEPTANCE STD.	<u>ASTM 1417/BS-038</u>	REV./DATE	<u>2005</u>		
ITEM(S) EXAMINED	<u>(2) STUDBS</u>						

JOB DESCRIPTION	PROCEDURE NO.	LT- <u>2002</u>	REV./DATE	<u>2008</u>	TECHNIQUE NO.	LT- <u>2002</u>	REV./DATE	<u>2008</u>
PART NO.	<u>SEE RESULTS</u>	MATERIAL	<u>Aluminum</u>	THICKNESS	<u>VARIABLES</u>			
SCOPE	<u>A WET FLOUORESCENT EXAMINATION WAS COMPLETED ON THE SURFACE ON LY 100%</u>							

TEST DETAILS	
METHOD <input checked="" type="checkbox"/> FLUORESCENT <input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> WATER WASH <input type="checkbox"/> SOLVENT REMOVABLE <input type="checkbox"/> POST EMULSIFIED
FAMILY BRAND <u>MAGNAVIS</u>	BLACK LIGHT S/N <u>16459</u> <input type="checkbox"/> OUTPUT > 1000 $\mu$ W/cm <sup>2</sup> <input type="checkbox"/> AMBIENT < 2 fc
PENETRANT <u>2460 2467</u> MINIMUM DWELL TIME <u>45</u> MIN.	LIGHTING EQUIP. <input type="checkbox"/> FLASHLIGHT <input type="checkbox"/> TROUBLELIGHT <input type="checkbox"/> OUTPUT > 100 fc @ SURFACE
PENETRANT REMOVER <u>H2O</u> MINIMUM DRY TIME <u>&gt;10</u> MIN.	OTHER <u>LABINO</u>
DEVELOPER <u>SKD 52</u> MINIMUM DWELL TIME <u>10</u> MIN.	LIGHT METER S/N <u>1098866</u> CAL DUE DATE <u>08/23/13</u>
DEVELOPER TYPE <input checked="" type="checkbox"/> NON AQUEOUS <input type="checkbox"/> AQUEOUS <input type="checkbox"/> DRY	

TEST SURFACE	
SURFACE CONDITION <input type="checkbox"/> AS GROUND <input type="checkbox"/> AS WELDED <input checked="" type="checkbox"/> MACHINED <input type="checkbox"/> SHOT BLASTED <input checked="" type="checkbox"/> CLEAN BARE METAL	
SURFACE TEMPERATURE <input type="checkbox"/> < - 4°C/ 20°F <input type="checkbox"/> - 4°C/ 20°F TO 10°C/50°F <input checked="" type="checkbox"/> 10°C/50°F TO 52°C/125°F <input type="checkbox"/> > 52°C/125°F	

RESULTS- <input checked="" type="checkbox"/> METRIC <input type="checkbox"/> IMPERIAL			
ITEM	COMMENTS	ACCEPT	REJECT
	<u>STUDBS</u> <u>W.O. #</u>		
<u>3</u>	<u>87080</u> <u>8/20/12</u>		
<u>2</u>	<u>88164</u>	<input checked="" type="checkbox"/>	
<u>5</u>	<u>83344</u>	<input checked="" type="checkbox"/>	
	<u>CROSS TUBES</u> <u>W.O. #</u>		
<u>1</u>	<u>88094</u>	<input checked="" type="checkbox"/>	
<u>1</u>	<u>88093</u>	<input checked="" type="checkbox"/>	

Scope of Services  
The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Standard of Care  
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SIGNATURES	
CLIENT REPRESENTATIVE <u>Marc Brunet</u>	DTR # <u>E-120511</u>
TECHNICIAN (SIGNATURE): <u>Mike Lott</u>	REPORT REVIEWED BY:
NAME (PRINT): <u>Mike Lott</u>	NAME INITIALS
CGSB LEVEL <u>II</u> SNT LEVEL <u>6606</u>	CGSB LEVEL SNT LEVEL
CGSB REG. NO. <u>6606</u>	CGSB REG. NO.

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